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28 May 1991

Mr. Dennis Smith
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P.O. Box 464
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Subject: RFI/RI Analytical Parameters
WESTON W.O. No.: 2029-33-11

Dear Mr. Smith:

At your request, this letter provides a strategy for amending the analytical parameter lists for RCRA Facility Investigations/Remedial Investigations (RFI/RIs) at Operable Unit Nos. 1 and 2 (OU1 and OU2) at the Rocky Flats Plant. The current versions of the RFI/RI Work Plans stipulate that soils, sediments, ground water, and surface water be analyzed for all Contract Laboratory Program (CLP) Target Compound List (TCL) organic compounds (for surface and ground water the requirement is for at least one round of samples). The analytical program is conservative for various reasons discussed herein; however, considering that the RFI/RI's for OU's 1 and 2 are in their third and second phases, respectively, it appears the need for such a comprehensive analytical program should be reevaluated. This letter presents a historical review of how the analyte lists evolved as well as an analysis of available sampling results from OUs 1 and 2 as justification for eliminating certain analytical suites from the overall program. The basis for developing a site-specific target analyte list is discussed in U.S Environmental Protection Agency (EPA) guidance documents for conducting remedial investigations and feasibility studies (EPA, 1988) and for developing data quality objectives for remedial response activities (EPA, 1989).

BACKGROUND

Comprehensive site characterizations began at OUs 1 and 2 in 1986. A Phase 1 RI report for OU1 was submitted in June 1987, and a Phase II report submitted in March 1988. For OU2, a Phase 1 RI report was submitted in December 1987. Site characterization for these previous RIs was based on analysis of soils, sediments, ground water and surface water for the CLP Hazardous Substance List (HSL) compounds. (Currently this list of analytes is known as the TCL; however, it should be noted that there are minor differences in the two lists.) Phase III and Phase II RFI/RI Work Plans have been prepared for OUs 1 and 2, respectively. These plans are designed to fill data gaps that were identified in the earlier phases of investigation.

The OUs 1 and 2 RFI/RI Work Plans specify analysis of soils, sediments, ground water, and surface water for all TCL organic compounds. Analysis for the full suite of TCL organics for ground water and surface water beyond the first round of samples would be dependent on the initial results. The need for continued full suite analysis would be based on an assessment approach not unlike that presented in this document. The TCL was chosen as the basis for characterizing these OUs because it is used by EPA in characterizing uncontrolled hazardous waste sites where historical waste disposal practices are often unknown, and because of the associated high quality assurance/quality control procedures that are widely accepted by both federal and state agencies. Although chlorinated solvents are the principal contaminants at these OUs based on historical waste disposal records and previously collected data, unknown chemicals were disposed at both locations which established the need for monitoring for a more comprehensive list of analytes.

With respect to soils, the full suite of TCL organics was specified, because at each OU, the upcoming phase of investigation is designed to provide a comprehensive characterization eliminating the need for subsequent phases of investigation. Semivolatiles and pesticides/PCBs are to be analyzed at OU1 because previously collected data indicated the ubiquitous occurrence of phthalate esters and the infrequent occurrence of PCBs. Also, at Individual Hazardous Substance Sites (IHSSs) 119.1 and 119.2, soils will be sampled beneath historical drum storage areas, the location for which was recently mapped by examining aerial photographs. Unknown wastes were disposed at this location. Borehole samples from OU2 are to be analyzed for semivolatiles and pesticides/PCBs because these boreholes will penetrate waste sources, and previous soil sampling was outside the waste source boundaries. Again, the full suite of TCL organics is specified because of the uncertainty of the types of waste that were disposed at the OU2 IHSSs.

Ground water and surface water are to be analyzed for the full suite of TCL organics because of the infrequent occurrence of semivolatiles or pesticides/PCBs based on previously collected data, and the limited quantity of historical data for these classes of chemicals (one to two rounds). Sediments will also be analyzed for the full suite of TCL organics largely because of it's relevance to contaminant migration in surface water.

APPROACH

The approach to defining a site-specific target analyte list consists of the following two steps:

Step 1: Summarize Existing Analytical Data by Analytical Suite

In step 1, all existing data are tabularized showing the total number of analyses for each chemical within an analytical suite, and the total number of detections of each chemical. This is performed for each medium that was characterized. Seven analytical suites within three major chemical groupings based on analytical protocol can be identified. The analytical suites are as follows:

Group A Compounds, TCL Volatiles

I. Ketones and Aldehydes
II. Monocyclic Aromatics
III. Chlorinated Aliphatics

Group B Compounds, TCL Semivolatiles

IV. Acid Extractables
V. Base/Neutral Extractables

Group C Compounds, Pesticides/PCBs

VI. PCBs
VII. Pesticides

This exercise yields one of three possible outcomes:

1) **Case 1:** The tabulation demonstrates that chemicals within one or more analytical suites in a specified media have not been detected at a given detection limit.

2) **Case 2:** The tabulation demonstrates that one or more chemicals from an analytical suite have been detected in a specified media either inconsistently or at low concentrations. This is the "maybe" case.

3) **Case 3:** The tabulation demonstrates consistent detections of one or more chemicals from an analytical suite in a specified media.

Step 2: Evaluation of Results

Each of the cases identified above have implications with regard to the elimination of an analytical suite from the analytical program. In Case 1, a good case can be made to eliminate the analytical suite provided the historical data are of adequate quality or useability, and are representative of the site. Data quality is assessed in accordance with the ER Program Quality Assurance Project Plan (QAPjP) and the General Radiochemistry and Analytical Services Protocol (GRAASP), and references therein. For case 3, continued monitoring for the analytical suite(s) in order to better characterize the medium is justified, particularly if the chemicals are mobile and toxic. Elimination of a suite of chemicals where historical data fits case 2, requires an assessment of data quality, chemical fate and transport, and human and environmental risks posed by the chemicals.

Assessment of chemical fate and transport and human/environmental risks is one of determining whether the chemical is at a concentration in a specific medium that poses an unacceptable risk to humans or the environment through a likely exposure pathway, and whether the chemical can migrate to another medium at concentrations that also pose an unacceptable risk.

Fate and Transport

Table 1 presents some of the relevant chemical/physical parameters that relate to the environmental fate and transport of representative chemicals from each of the analytical suites previously identified. The general tendency for chemicals from each group to migrate from one environmental medium to another is discussed below. This is summarized in Table 2.

Group A Compounds, TCL Volatile Organic Compounds

Generally, TCL volatiles have computed mobility indices that suggest high mobility in the environment. They are characterized by relatively high water solubility (greater that 100 mg/l) and volatility (vapor pressures generally much greater than 1 mm Hg and Henry's Law Constants greater than 0.1). Volatiles can be expected to migrate through soils, and to be transported by ground water and surface water as neutral solutes. This is denoted by the saturated zone retardation factors (Rds) between 1 and 50. (Note: chemical migration velocity = water migration velocity/Rd). The substantial vapor pressures and Henry's Law Constants suggest a tendency to volatilize from aqueous systems (including soil water) to the atmosphere.

Group B and C Compounds, Semivolatiles and Pesticides/PCBs

In general, semivolatiles and pesticides/PCBs are considered to be slightly to very immobile (pesticides and PCBs are particularly immobile). Again this is denoted by the high saturated zone retardation factors. Phenols are the most mobile of these compounds owing to their high water solubility. Semivolatile and pesticide/PCBs exhibit low to negligible volatilities as indicated by the very low vapor pressures and Henry's Law Constants. This suggest a low propensity for volatilization of these compounds to the atmosphere from soil and soil water.

Toxicity

Without the benefit of a risk assessment, it is necessary to rely on published acceptable concentrations for chemicals to preliminarily estimate the risk posed by the various chemicals in each of the media they are found. Many of these published standards are considered Applicable or Relevant and Appropriate Requirements (ARARs). In this analysis, because of the chemicals and media deserving of discussion, Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs) and Action Levels under EPA's proposed RCRA Corrective Action Regulations are used to provide an estimate of concentrations of chemicals that should not pose an unacceptable risk to human health. The Action Levels are based on likely chemical exposure scenarios, a 10^{-6} incremental cancer risk (for carcinogens), or a no adverse health effect from a lifetime of exposure to a systemic contaminant (non carcinogen). MCLs and Action Levels used in this assessment are shown in Table 3.

FINDINGS

Data Quality and Useability

Most of the water quality data are either valid or acceptable with qualifications relative to guidance provided in the QAPjP and GRAASP. However, high concentrations of acetone, butanone, and methylene chloride in the laboratory blanks for the 1986 and 1987 investigations, render it impossible to ascertain their presence in samples as an indication of site contamination. More recent valid data indicate they are not likely site contaminants in ground water or surface water.

With respect to soils, volatile organic data were rejected principally because of the high dilutions used (high detection limits). Therefore these data have useability recognizing this limitation. However, the same issue regarding the above noted common laboratory contaminants also applies to soils. Semivolatile and pesticide/PCB analyses of soils are valid or acceptable with qualifications based on limited data validation.

With respect to representativeness, the previous results are from boreholes or wells that adequately span the site, and are thus representative of the site from a spatial perspective. Ground water data, and to a lesser extent surface water data, cover a several year time span and "capture" seasonality. However, it is noted that boreholes at OU2 did not penetrate waste sources. Therefore, previous soil data cannot be considered representative of buried wastes.

Results

Tables 4 and 5 provide a tabulation of the total number of analyses (based on summing the number of analyses performed for each chemical within an analytical suite) for each analytical suite and the number of occurrences where a chemical was detected. The tabulation is for all data within the Rocky Flats Environmental Database System (RFEDS). A detection is defined as the reporting of a concentration of a chemical that is above the detection limits identified in the GRAASP. Surface water and sediment data for OU1 is not currently within RFEDS and therefore a tabulation for these media is not provided. Because contaminated surface water and sediments arise from interaction with contaminated ground water or runoff (from soils), the conclusions drawn about soils and ground water analytical suites apply to monitoring of these media.

Ground Water and Surface Water

Volatiles

As shown in Table 6, 7 and 8, volatiles are frequently detected and in significant concentrations. The chlorinated aliphatics occur ubiquitously and at high concentrations. These compounds are known waste constituents and are relatively toxic. As a class, the volatiles represent Case 3.

However, upon closer examination of the tables, the monocyclic aromatics (benzene, toluene, ethylbenzene, and xylene) occur infrequently. Toluene, ethylbenzene, and xylene occur at concentrations an order of magnitude below their acceptable concentrations. Benzene occurs least frequently of the compounds in this class (only 3 occurrences in 1,044 total analyses). Concentrations are always below 100 ug/l, and although this is above the acceptable concentration (5 ug/l), the rare occurrence of benzene combined with the low concentrations of the other monocyclic aromatics, warrants discontinuation of analysis for this class of compounds. Also note that benzene is a compound easily removed from water by activated carbon or air stripping, and therefore poses no unusual treatment requirements where ground water or surface water treatment will be necessary during remediation.

Acetone, and to a lesser extent other ketones, appears reasonably frequently in the samples. However, the occurrence of acetone in a sample is often due to laboratory contamination, and there is only one occurrence of acetone above the action level (well 36-87 at OU2; 4,100 ug/l (action level = 4,000 ug/l)). Concentrations of acetone are generally two orders of magnitude less than the action level. Based on the high acceptable concentrations of acetone and 2-butanone, it can be surmised that ketones are relatively non-toxic, and the less frequent occurrence of other ketones at low concentrations is of little concern. Because of the

one high concentration of acetone at well 36-87 in OU2, it is concluded that only select samples be analyzed for ketones at OU2, and otherwise, ketones be eliminated from future analysis at OU1.

Summary

- Retain future monitoring for chlorinated aliphatics.
- Eliminate monocyclic aromatics from future water sample analyses.
- Eliminate ketone analyses from future OU1 water sample analyses, with only select samples from OU2 analyzed for ketones.

Semivolatiles (acid extractables)

As shown in Tables 9, 10, and 11, out of 665 total analyses for acid extractables, there have only been two detections of a chemical within this analytical suite. Both detections are of phenol in surface water at OU2 at concentrations less than 20 ug/l. The action level for phenol in water is 20,000 ug/l. There is no history of disposal of wastes containing acid extractable compounds. Also considering the infrequent occurrence and very low concentrations of acid extractables, elimination of this analytical suite from future water monitoring at OUs 1 and 2 is justified.

Summary

- Eliminate future analysis for acid extractables in water at both OUs.

Semivolatiles (base/neutral extractables)

Out of 3,800 analyses for base/neutral extractables in water at OUs 1 and 2 (Tables 12, 13, and 14), there are only 7 occurrences of chemicals in this class being detected. These chemicals are phthalate esters at concentrations less than 25 ug/l. Although the action level for phthalate is 3 ug/l, the very infrequent occurrence of this compound at low concentrations is the basis for elimination of base/neutral extractables from future monitoring at OUs 1 and 2. Also, phthalates should be readily removed from water by activated carbon owing to their insolubility and high octanol water partition coefficient.

Summary

- Eliminate future analysis for base/neutral extractables in water at both OUs.

Pesticides/PCBs

As shown in Tables 15, 16, and 17, out of 2,890 total analyses for chemicals within the pesticide/PCB analytical suite there have been only 3 detections of atrazine and one detection of parathion. The concentrations of atrazine are all well below 3 ug/l, the MCL for atrazine, and the concentration of parathion is well below its action level, 200 ug/l. There is no record of disposal of pesticides and PCBs at OUs 1 and 2. The low and infrequent occurrences of pesticides and PCBs in water is the basis for their elimination from future monitoring programs for OUs 1 and 2. They should be readily removed from water by activated carbon based on their insolubility and high octanol water partition coefficients.

Summary

- Eliminate future analysis for pesticides and PCBs in water at both OUs.

Soils and Sediments

Volatiles

As shown in Tables 18, 19, and 20, like ground water and surface water, volatile organics occur in soils and sediments with high frequency and at high concentrations. However, also like ground water and surface water, there is justification for elimination of monocyclic aromatics and ketones from future soils/sediments

chemical analysis. The monocyclic aromatics occur infrequently and concentrations far below their acceptable concentrations. Acetone, and to a lesser extent the other ketones, occur more frequently than the monocyclic aromatics, but they are present at concentrations significantly less than their acceptable concentrations. They may also represent laboratory artifact as these compounds frequently occurred in the associated laboratory blanks. Although ketones are highly mobile in the environment, ground water and surface water quality data collected to date do not indicate that they are migrating into these media at concentrations that would exceed their acceptable concentrations.

It is recommended that soils/sediments at OU1 not be analyzed for monocyclic aromatics and ketones, and sediments at OU2 not be analyzed for these constituents. At OU1, the existing borehole locations adequately cover the entire site, and they penetrated the IHSSs. On the other hand, the Phase II Work Plan for OU2 specifies that boreholes be located within IHSSs. This was not previously performed at this location. Historical records indicate that acetone may have been stored at the 903 Pad. Complete characterization of OU2 waste sources will require that soils from the new borings be analyzed for all volatiles.

Summary

- Eliminate future soils/sediments analysis for monocyclic aromatics and ketones at OU1.
- Eliminate future sediment analysis for monocyclic aromatics and ketones, but retain the complete volatile scan for borehole samples at OU2.

Semivolatiles (acid extractables)

Out of 1,218 total analyses for acid extractables, there are only two detections of chemicals in this class for soils/sediments at OUs 1 and 2. Pentachlorophenol was detected at 270 ug/kg and phenol was detected at 650 ug/kg in sediments at OU2. These concentrations are far below their respective acceptable concentrations. Although phenol is mobile in the environment, water quality data do not support that it is capable of migrating into ground water or surface water at concentrations that would exceed it's acceptable concentration, i.e., phenol is infrequently detected in water, and only at low concentrations. However, like the volatiles, the OU2 borehole samples should be analyzed for acid extractables, and otherwise, soils and sediments need not be analyzed for this class of compounds.

Summary

- Eliminate future soils/sediments analysis for acid extractables at OU1.
- Eliminate future sediment analysis for acid extractables, but retain the complete acid extractable scan for borehole samples at OU2.

Semivolatiles (base/neutral extractables)

There are frequent occurrences of base/neutral extractables in soils/sediments at OUs 1 and 2. However, phthalate esters represent the majority of these occurrences. The presence of phthalate esters in samples is surmised to be due to field contamination from handling the samples with plastic gloves. Regardless, the concentrations of the phthalate esters are far below the acceptable concentration for bis(2-ethylhexyl) phthalate (assumed to be representative of the class). Also, phthalates are extremely immobile in the environment. This is demonstrated by the site data that show only one occurrence of phthalates in water at OUs 1 and 2. Polynuclear aromatic hydrocarbons (PNAs) comprise the remainder of the occurrences of base/neutral extractables in soils/sediments. The occurrence of PNAs is infrequent, and with the exception of two samples (concentrations of 350 and 370 ug/kg), concentrations of PNAs are below the detection limit of 330 ug/kg. PNAs are also immobile in the environment which is supported by the site water quality data. Because the boreholes at OU2 will penetrate IHSSs for the first time, it is recommended that only those soil samples be analyzed for base/neutral extractables.

Summary

- Eliminate future soils/sediments analysis for base/neutral extractables at OU1.
- Eliminate future sediment analysis for base/neutral extractables, but retain the complete base/neutral extractable scan for borehole samples at OU2.

Pesticides/PCBs

Out of 4,423 total analyses for pesticides/PCBs, there are only 8 occurrences of PCBs, and pesticides were not detected. The concentrations of the PCBs are all below the action level of 90 ug/kg, and PCBs are immobile in the environment. Because the boreholes at OU2 will penetrate IHSSs for the first time, it is recommended that only those soil samples be analyzed for pesticides/PCBs.

Summary

- Eliminate future soils/sediments analysis for pesticides/PCBs at OU1.
- Eliminate future sediment analysis for pesticides/PCBs, but retain the complete pesticide/PCB scan for borehole samples at OU2.

CONCLUSIONS

The summaries presented above delineate deletions of analytical suites from future monitoring of environmental media at OUs 1 and 2. This assessment is promising, albeit, preliminary. Please note that the data base searches require careful proofing. For example, it was not possible to bring up the surface water and sediment data for OU1, yet the data should be present in RFEDS. Also, some boreholes are listed under both OUs, and in general, documentation of the entire gamut of data that was scanned is necessary.

WESTON looks forward to your comments on this document. (We can improve the presentation of the tables on the next draft). As always, WESTON appreciates the opportunity to be of continued service to EG&G. Please thank Mark Neilsen for his ready responsiveness in assisting with the database searches.

Sincerely,

ROY F. WESTON, INC.

Michael A. Anderson

Michael A. Anderson, Ph.D., P.E.
Vice President

cc: Suzanne Paschke, WESTON
Tom Greengard, EG&G
2029-33-11

TABLE 1

CHEMICAL/PHYSICAL PARAMETERS AFFECTING
ENVIRONMENTAL FATE AND TRANSPORT
(See Notes)

Group A Compounds, TCL Volatile Organics

I Ketones & Aldehydes

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env. Mobility
Acetone	55.1	0.1	270.00	0.013	60000.0	-0.24	-0.43	1.0	8	Extremely Mobile

II Monocyclic Aromatics

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env. Mobility
Benzene	78.1	0.9	76.00	0.182	1780.0	2.13	1.81	6.8	3	Very Mobile
Toluene	92.1	0.9	22.00	0.214	515.0	2.79	2.48	28.0	2	Very Mobile
Ethyl Benzene	106.2	0.9	7	0.266	152.0	3.34	3.04	100.0	-0	Slightly Mobile
Xylene	106.2	0.9	10	0.380	152.0	3.13	2.11	12.6	1	Very Mobile

III Chlorinated Aliphatics

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env. Mobility
Carbon Tetrachloride	153.8	1.6	90.00	0.960	785.0	2.96	2.64	40.5	2	Very Mobile
Trichloroethene	131.4	1.5	60.00	0.390	1100.0	2.42	2.10	12.3	3	Very Mobile
Chloroform	119.4	1.5	160.00	0.130	8000.0	1.97	1.64	4.9	4	Very Mobile
1,1,2,2-Trichloroethane	167.9	1.6	5.00	0.016	2900.0	2.39	2.07	11.6	2	Very Mobile

Group B Compunds, Semi-Volatile Organics

IV Acid Extractables (Phenolics)

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env. Mobility
Phenol	94.1	1.1	0.20	1.2E-04	8200.0	1.46	1.15	2.3	2	Very Mobile
Pentachlorophenol	266.4	2.0	1.1E-04	1.1E-04	14.0	5.18	4.72	4771.3	-8	Immobile
2,4-Dinitrophenol	184.1	1.7	1.5E-05	2.7E-08	5600.0	1.54	1.22	2.5	-2	Slightly Immobile
2,4,6-Trichlorophenol	197.5	1.5	0.012	1.6E-04	800.0	3.61	3.30	181.0	-2	Slightly Immobile

V Base-Neutral Extractables

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env. Mobility
Bis(2-ethylhexyl)phthalate	391.1	1.0	2.7E-07	4.4E-06	1.3	9.61	9.30	1.8E+08	-16	Very Immobile
Chrysene	228.2	1.3	1.0E-11	6.9E-08	0.0	5.61	5.30	1.8E+04	-19	Very Immobile
1,2,4-Trichlorobenzene	181.5	1.5	0.29	9.6E-02	30	4.28	3.96	8.3E+02	-3	Slightly Immobile
1,3-Dichlorobenzene	147.0	1.3	2.28	1.5E-01	123	4.28	3.96	8.3E+02	-2	Slightly Immobile
Naphthalene	128.2	1.0	0.087	1.9E-02	31.7	3.29	2.97	8.6E+01	-3	Slightly Immobile
Benzo(a)pyrene	252.0	1.4	5.6E-09	2.0E-05	3.8E-03	6.06	6.74	5.0E+05	-17	Very Immobile

Group C Compounds, PCB's and Pesticides

VI PCB's

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env. Mobility
PCB-1248	299.5	1.4	4.9E-04	1.5E-01	0.054	5.76	5.44	24931.0	-10	Immobile
PCB-1254	328.4	1.5	7.7E-05	4.6E-02	0.0	6.03	5.72	47233.7	-11	Very Immobile
PCB 1260	375.7	1.6	4.1E-05	2.8E-01	0.0	7.15	6.82	594625.1	-14	Very Immobile

VII Chlorinated Pesticides

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env. Mobility
Dieldrin	381.0	1.8	1.8E-07	1.9E-05	0.2	3.54	3.23	153.8	-11	Very Immobile
DDT	375.7	1.6	1.9E-07	7.1E-04	5.5E-03	6.91	6.59	350141.6	-16	Very Immobile
Heptachlor	375.0	1.6	3.0E-04	3.4E-02	0.18	4.4	4.1	1081.0	-8	Immobile
Lindane	291.0	1.6	2.5E-05	2.5E-04	1.6	3.9	3.6	343.0	-8	Immobile
Chlordane	409.8	1.6	1.0E-05	4.0E-03	0.056	5.5	5.1	12601.0	-11	Very Immobile
Toxaphene	414.0	1.6	0.3	1.4E+01	0.5	3.3	3.0	87.8	-4	

TABLE 2

SUMMARY OF ENVIRONMENTAL
INTER-MEDIA MIGRATION
CHARACTERISTICS

Inter-Media Migration Characteristic	Aldehydes & Ketones	Monocyclic Aromatics	Chlorinated Aliphatics	Acid Extractables	Base-Neutral Extractables	PCB's	Pesticides
Soil to Groundwater	Yes	Yes	Yes	Yes	No	No	No
Soil or Soil Water to Air	No	Yes	Yes	No	No	No	No
Migration in Groundwater	Yes	Yes	Yes	Yes	No*	No	No

*Maybe a little!!!

TABLE 3
HEALTH-BASED ACCEPTABLE CONTAMINANT CONCENTRATIONS

COMPOUND	MCL (ug/l)	RCRA ACTION LEVEL	
		WATER (ug/l)	SOIL (ug/kg)
Volatiles			
Benzene	5		
Ethylbenzene	700		8,000,000
Toluene	1,000		20,000,000
Xylene	10,000		200,000,000
Acetone		4,000	8,000,000
2- Butanone		2,000	4,000,000
Semivolatiles			
Bis(2-ethylhexyl)phthalate		3	50,000
Phenol		20,000	50,000,000
Pentachlorophenol		1,000	2,000,000
PCBs and Pesticides			
PCBs			90
Parathion		200	

TABLE 4

Summary of Detected Compounds for
Operable Unit No. 1
Phase I and Phase II RIs

Matrix: Soil

Analytical Suite	Hits / Analyses	Case	Comment
Pesticides/PCBs	3 / 2139	2	No History of Release at the Site
Acid Extractables	0 / 609	1	No History of Release at the Site
Base-Neutral Extractables	141 / 3480	2	No History of Release at the Site Extremely Immobile in Soils
Volatile Organic Compounds	219 / 2771	3	Assumed to be Site-Related

Matrix: Ground Water

Analytical Suite	Hits / Analyses	Case	Comment
Pesticides/PCBs	0 / 121	1	No History of Release at the Site
Acid Extractables	0 / 21	1	No History of Release at the Site
Base-Neutral Extractables	1 / 120	2	No History of Release at the Site Extremely Immobile in Saturated
Volatile Organic Compounds	262 / 6760	3	Assumed to be Site-Related

TABLE 5

Summary of Detected Compounds for
Operable Unit No. 2
Phase I RI

Matrix: Soil

Analytical Suite	Hits / Analyses	Case	Comment
Pesticides/PCBs	5 / 1798	2	No History of Release at the Site
Acid Extractables	0 / 490	1	No History of Release at the Site
Base-Neutral Extractables	115 / 2800	2,3	Possible History of Release
Volatile Organic Compounds	161 / 2244	2,3	Site Related and Lab Contaminants

Matrix: Sediments

Analytical Suite	Hits / Analyses	Case	Comment
Pesticides/PCBs	0 / 486	1	No History of Release at the Site
Acid Extractables	2 / 119	2	No History of Release at the Site
Base-Neutral Extractables	25 / 672	2	Possible History of Release
Volatile Organic Compounds	40 / 1221	2,3	Probably Site Related Also Lab Contaminants

Matrix: Ground-Water

Analytical Suite	Hits / Analyses	Case	Comment
Pesticides/PCBs	1 / 401	2	No History of Release at the Site
Acid Extractables	0 / 77	1	No History of Release at the Site
Base-Neutral Extractables	3 / 440	2	Possible History of Release
Volatile Organic Compounds	524 / 14133	2,3	Site Related and Lab Contaminants

Matrix: Surface Water

Analytical Suite	Hits / Analyses	Case	Comment
Pesticides/PCBs	3 / 2368	2	No History of Release at the Site
Acid Extractables	2 / 567	2	No History of Release at the Site
Base-Neutral Extractables	3 / 3240	2	Possible History of Release
Volatile Organic Compounds	338 / 14108	2,3	Site Related and Lab Contaminants

TABLE 6

Analyte groups for OU1 voc groundwater data with a limit of 5.0 31
19:42 Monday, May 27, 1991

#	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,1,1-TRICHLOROETHANE	207	24	30250	UG/L	7222.50
2	1,1,2,2-TETRACHLOROETHANE	203	0	.		.
3	1,1,2-TRICHLOROETHANE	209	11	96	UG/L	69.18
4	1,1-DICHLOROETHANE	204	4	150	UG/L	78.50
5	1,1-DICHLOROETHENE	208	21	48000	UG/L	8722.95
6	1,2-DICHLOROETHANE	208	6	75	UG/L	30.67
7	1,2-DICHLOROPROPANE	204	0	.		.
8	2-BUTANONE	204	6	660	UG/L	321.17
9	2-HEXANONE	204	1	43	UG/L	43.00
10	4-METHYL-2-PENTANONE	204	3	96	UG/L	69.00
11	ACETONE	204	41	460	UG/L	82.05
12	BENZENE	204	1	83	UG/L	83.00
13	BROMODICHLOROMETHANE	204	0	.		.
14	BROMOFORM	204	0	.		.
15	BROMOMETHANE	204	0	.		.
16	CARBON DISULFIDE	204	1	8	UG/L	8.00
17	CARBON TETRACHLORIDE	208	20	8100	UG/L	2085.80
18	CHLOROBENZENE	203	0	.		.
19	CHLOROETHANE	203	0	.		.
20	CHLOROFORM	208	15	170	UG/L	60.53
21	CHLOROMETHANE	204	0	.		.
22	DIBROMOCHLOROMETHANE	204	0	.		.
23	ETHYLBENZENE	204	1	6	UG/L	6.00
24	METHYLENE CHLORIDE	204	20	580	UG/L	77.50
25	STYRENE	203	0	.		.
26	TETRACHLOROETHENE	208	31	8100	UG/L	2932.71
27	TOLUENE	205	10	270	UG/L	92.20
28	TOTAL XYLENES	204	0	.		.
29	TRICHLOROETHENE	207	45	72000	UG/L	5195.71
30	VINYL ACETATE	204	1	8	UG/L	8.00
31	VINYL CHLORIDE	203	0	.		.
32	cis-1,3-DICHLOROPROPENE	205	0	.		.
33	trans-1,3-DICHLOROPROPENE	204	0	.		.
		6760	262			

TABLE 7

Analyte groups for voc groundwater data with a limit of 5.0 9
ovl 19:42 Monday, May 27, 1991

	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,1,1-TRICHLOROETHANE	430	10	1472	UG/L	167.50
2	1,1,2,2-TETRACHLOROETHANE	428	1	6	UG/L	6.00
3	1,1,2-TRICHLOROETHANE	429	0	.		.
4	1,1-DICHLOROETHANE	428	6	62	UG/L	50.17
5	1,1-DICHLOROETHENE	429	21	1044	UG/L	93.86
6	1,2-DICHLOROETHANE	429	1	400	UG/L	400.00
7	1,2-DICHLOROPROPANE	428	0	.		.
8	2-BUTANONE	428	12	800	UG/L	127.92
9	2-HEXANONE	428	2	975	UG/L	501.50
10	4-METHYL-2-PENTANONE	428	3	35	UG/L	17.33
11	ACETONE	428	49	4100	UG/L	112.47
12	BENZENE	428	0	.		.
13	BROMODICHLOROMETHANE	428	0	.		.
14	BROMOFORM	428	0	.		.
15	BROMOMETHANE	428	0	.		.
16	CARBON DISULFIDE	428	2	12	UG/L	9.50
17	CARBON TETRACHLORIDE	429	89	7900	UG/L	1013.34
18	CHLOROBENZENE	428	0	.		.
19	CHLOROETHANE	428	0	.		.
20	CHLOROFORM	429	67	5427	UG/L	182.84
21	CHLOROMETHANE	428	0	.		.
22	DIBROMOCHLOROMETHANE	428	0	.		.
23	ETHYLBENZENE	428	0	.		.
24	METHYLENE CHLORIDE	428	53	1400	UG/L	97.40
25	STYRENE	428	2	27	UG/L	18.00
26	TETRACHLOROETHENE	429	91	528000	UG/L	9308.19
27	TOLUENE	428	4	53	UG/L	23.00
28	TOTAL XYLENES	428	2	23	UG/L	15.00
29	TRICHLOROETHENE	429	98	118298	UG/L	4683.41
30	VINYL ACETATE	428	0	.		.
31	VINYL CHLORIDE	428	11	930	UG/L	450.73
32	cis-1,3-DICHLOROPROPENE	428	0	.		.
33	trans-1,3-DICHLOROPROPENE	428	0	.		.
		14133	524			

TABLE 8

Analyte groups for voc surfacewater data with a limit of 5.0 10
002 19:42 Monday, May 27, 1991

#	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,1,1-TRICHLOROETHANE	429	17	42	UG/L	17.782
2	1,1,2,2-TETRACHLOROETHANE	429	0	.		.
3	1,1,2-TRICHLOROETHANE	429	0	.		.
4	1,1-DICHLOROETHANE	429	7	50	UG/L	13.000
5	1,1-DICHLOROETHENE	415	8	73	UG/L	21.875
6	1,2-DICHLOROETHANE	429	0	.		.
7	1,2-DICHLOROPROPANE	429	0	.		.
8	2-BUTANONE	431	7	20	UG/L	14.143
9	2-HEXANONE	429	0	.		.
10	4-METHYL-2-PENTANONE	429	0	.		.
11	ACETONE	435	49	65	UG/L	15.122
12	BENZENE	415	2	42	UG/L	33.000
13	BROMODICHLOROMETHANE	429	0	.		.
14	BROMOFORM	429	0	.		.
15	BROMOMETHANE	429	0	.		.
16	CARBON DISULFIDE	429	0	.		.
17	CARBON TETRACHLORIDE	430	41	605	UG/L	89.461
18	CHLOROBENZENE	415	1	7	UG/L	7.000
19	CHLOROETHANE	429	0	.		.
20	CHLOROFORM	431	32	84	UG/L	29.500
21	CHLOROMETHANE	430	0	.		.
22	DIBROMOCHLOROMETHANE	429	0	.		.
23	ETHYLBENZENE	429	0	.		.
24	METHYLENE CHLORIDE	437	62	68	UG/L	10.835
25	STYRENE	429	0	.		.
26	TETRACHLOROETHENE	429	25	280	UG/L	113.280
27	TOLUENE	415	13	18	UG/L	9.308
28	TOTAL XYLENES	429	10	40	UG/L	12.100
29	TRICHLOROETHENE	415	47	1600	UG/L	121.106
30	VINYL ACETATE	429	0	.		.
31	VINYL CHLORIDE	429	17	16	UG/L	10.059
32	cis-1,3-DICHLOROPROPENE	429	0	.		.
33	trans-1,3-DICHLOROPROPENE	430	0	.		.
		14108	338			

TABLE 9

Analyte groups for OU1 acid extractable groundwater data with a limit of 5.0

19:42 Monday, May 27, 1991 35

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,6-TRICHLOROPHENOL	3	0	.		.
2	2,4-DICHLOROPHENOL	3	0	.		.
3	2,4-DIMETHYLPHENOL	3	0	.		.
4	2,4-DINITROPHENOL	3	0	.		.
5	2-NITROPHENOL	3	0	.		.
6	PENTACHLOROPHENOL	3	0	.		.
7	PHENOL	3	0	.		.
		21	0			

TABLE 10

Analyte groups for acid extractable groundwater data with a limit of 5.0 17
JU2 19:42 Monday, May 27, 1991

	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,6-TRICHLOROPHENOL	11	0	.		.
2	2,4-DICHLOROPHENOL	11	0	.		.
3	2,4-DIMETHYLPHENOL	11	0	.		.
4	2,4-DINITROPHENOL	11	0	.		.
5	2-NITROPHENOL	11	0	.		.
6	PENTACHLOROPHENOL	11	0	.		.
7	PHENOL	11	0	.		.
		77	0			

TABLE 11

Analyte groups for acid extractable surfacewater data with a limit of 5.0 18
ou 2 19:42 Monday, May 27, 1991

#	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,6-TRICHLOROPHENOL	81	0	.		.
2	2,4-DICHLOROPHENOL	81	0	.		.
3	2,4-DIMETHYLPHENOL	81	0	.		.
4	2,4-DINITROPHENOL	81	0	.		.
5	2-NITROPHENOL	81	0	.		.
6	PENTACHLOROPHENOL	81	0	.		.
7	PHENOL	81	2	15	UG/L	14
		567	2			

TABLE 12

nalyte groups for OU1 base neutral extractable groundwater data with a limit

19:42 Monday, May 27, 1991 33

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2-DICHLOROBENZENE	3	0	.		.
2	1,3-DICHLOROBENZENE	3	0	.		.
3	1,4-DICHLOROBENZENE	3	0	.		.
4	2,4-DINITROTOLUENE	3	0	.		.
5	2,6-DINITROTOLUENE	3	0	.		.
6	2-CHLORONAPHTHALENE	3	0	.		.
7	2-CHLOROPHENOL	3	0	.		.
8	3,3'-DICHLOROBENZIDINE	3	0	.		.
9	4-CHLORO-3-METHYLPHENOL	3	0	.		.
10	4-CHLOROPHENYL PHENYL ETHER	3	0	.		.
11	4-NITROPHENOL	3	0	.		.
12	ACENAPHTHENE	3	0	.		.
13	ACENAPHTHYLENE	3	0	.		.
14	ANTHRACENE	3	0	.		.
15	BENZO(a)ANTHRACENE	3	0	.		.
16	BENZO(a)PYRENE	3	0	.		.
17	BENZO(b)FLUORANTHENE	3	0	.		.
18	BENZO(ghi)PERYLENE	3	0	.		.
19	BENZO(k)FLUORANTHENE	3	0	.		.
20	BIS(2-CHLOROETHOXY)METHANE	3	0	.		.
21	BIS(2-CHLOROETHYL)ETHER	3	0	.		.
22	BIS(2-CHLOROISOPROPYL)ETHER	3	0	.		.
	BIS(2-ETHYLHEXYL)PHTHALATE	3	1	15	UG/L	15
	CHRYSENE	3	0	.		.
25	DI-n-BUTYL PHTHALATE	3	0	.		.
26	DI-n-OCTYL PHTHALATE	3	0	.		.
27	DIBENZO(a,h)ANTHRACENE	3	0	.		.
28	DIETHYL PHTHALATE	3	0	.		.
29	DIMETHYL PHTHALATE	3	0	.		.
30	FLUORANTHENE	3	0	.		.
31	FLUORENE	3	0	.		.
32	HEXACHLOROBENZENE	3	0	.		.
33	HEXACHLOROBUTADIENE	3	0	.		.
34	HEXACHLOROETHANE	3	0	.		.
35	INDENO(1,2,3-cd)PYRENE	3	0	.		.
36	ISOPHORONE	3	0	.		.
37	N-NITROSO-DI-n-PROPYLAMINE	3	0	.		.
38	NAPHTHALENE	3	0	.		.
39	NITROBENZENE	3	0	.		.
40	PHENANTHRENE	3	0	.		.
		120	1			

TABLE 13

Analyte groups for base neutral extractable groundwater data with a limit of 5

19:42 Monday, May 27, 1991 13

	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2-DICHLOROBENZENE	11	0	.		.
2	1,3-DICHLOROBENZENE	11	0	.		.
3	1,4-DICHLOROBENZENE	11	0	.		.
4	2,4-DINITROTOLUENE	11	0	.		.
5	2,6-DINITROTOLUENE	11	0	.		.
6	2-CHLORONAPHTHALENE	11	0	.		.
7	2-CHLOROPHENOL	11	0	.		.
8	3,3'-DICHLOROBENZIDINE	11	0	.		.
9	4-CHLORO-3-METHYLPHENOL	11	0	.		.
10	4-CHLOROPHENYL PHENYL ETHER	11	0	.		.
11	4-NITROPHENOL	11	0	.		.
12	ACENAPHTHENE	11	0	.		.
13	ACENAPHTHYLENE	11	0	.		.
14	ANTHRACENE	11	0	.		.
15	BENZO(a)ANTHRACENE	11	0	.		.
16	BENZO(a)PYRENE	11	0	.		.
17	BENZO(b)FLUORANTHENE	11	0	.		.
18	BENZO(ghi)PERYLENE	11	0	.		.
19	BENZO(k)FLUORANTHENE	11	0	.		.
20	BIS(2-CHLOROETHOXY)METHANE	11	0	.		.
21	BIS(2-CHLOROETHYL)ETHER	11	0	.		.
22	BIS(2-CHLOROISOPROPYL)ETHER	11	0	.		.
23	BIS(2-ETHYLHEXYL)PHTHALATE	11	2	11	UG/L	11
24	CHRYSENE	11	0	.		.
25	DI-n-BUTYL PHTHALATE	11	1	21	UG/L	21
26	DI-n-OCTYL PHTHALATE	11	0	.		.
27	DIBENZO(a,h)ANTHRACENE	11	0	.		.
28	DIETHYL PHTHALATE	11	0	.		.
29	DIMETHYL PHTHALATE	11	0	.		.
30	FLUORANTHENE	11	0	.		.
31	FLUORENE	11	0	.		.
32	HEXACHLOROBENZENE	11	0	.		.
33	HEXACHLOROBUTADIENE	11	0	.		.
34	HEXACHLOROETHANE	11	0	.		.
35	INDENO(1,2,3-cd)PYRENE	11	0	.		.
36	ISOPHORONE	11	0	.		.
37	N-NITROSO-DI-n-PROPYLAMINE	11	0	.		.
38	NAPHTHALENE	11	0	.		.
39	NITROBENZENE	11	0	.		.
40	PHENANTHRENE	11	0	.		.
		440	3			

TABLE 14

Analyte groups for base neutral extractable surfacewater data with a limit of
ppb
19:42 Monday, May 27, 1991 14

	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2-DICHLOROBENZENE	81	0	.		.
2	1,3-DICHLOROBENZENE	81	0	.		.
3	1,4-DICHLOROBENZENE	81	0	.		.
4	2,4-DINITROTOLUENE	81	0	.		.
5	2,6-DINITROTOLUENE	81	0	.		.
6	2-CHLORONAPHTHALENE	81	0	.		.
7	2-CHLOROPHENOL	81	0	.		.
8	3,3'-DICHLOROBENZIDINE	81	0	.		.
9	4-CHLORO-3-METHYLPHENOL	81	0	.		.
10	4-CHLOROPHENYL PHENYL ETHER	81	0	.		.
11	4-NITROPHENOL	81	0	.		.
12	ACENAPHTHENE	81	0	.		.
13	ACENAPHTHYLENE	81	0	.		.
14	ANTHRACENE	81	0	.		.
15	BENZO(a)ANTHRACENE	81	0	.		.
16	BENZO(a)PYRENE	81	0	.		.
17	BENZO(b)FLUORANTHENE	81	0	.		.
18	BENZO(ghi)PERYLENE	81	0	.		.
19	BENZO(k)FLUORANTHENE	81	0	.		.
20	BIS(2-CHLOROETHOXY)METHANE	81	0	.		.
21	BIS(2-CHLOROETHYL)ETHER	81	0	.		.
22	BIS(2-CHLOROISOPROPYL)ETHER	81	0	.		.
23	BIS(2-ETHYLHEXYL)PHTHALATE	81	2	15	UG/L	11.5
24	CHRYSENE	81	0	.		.
25	DI-n-BUTYL PHTHALATE	81	1	17	UG/L	17.0
26	DI-n-OCTYL PHTHALATE	81	0	.		.
27	DIBENZO(a,h)ANTHRACENE	81	0	.		.
28	DIETHYL PHTHALATE	81	0	.		.
29	DIMETHYL PHTHALATE	81	0	.		.
30	FLUORANTHENE	81	0	.		.
31	FLUORENE	81	0	.		.
32	HEXACHLOROBENZENE	81	0	.		.
33	HEXACHLOROBUTADIENE	81	0	.		.
34	HEXACHLOROETHANE	81	0	.		.
35	INDENO(1,2,3-cd)PYRENE	81	0	.		.
36	ISOPHORONE	81	0	.		.
37	N-NITROSO-DI-n-PROPYLAMINE	81	0	.		.
38	NAPHTHALENE	81	0	.		.
39	NITROBENZENE	81	0	.		.
40	PHENANTHRENE	81	0	.		.
		3240	3			

TABLE 15

Analyte groups for OU1 pesticide/PCB groundwater data with a limit of .05 29
19:42 Monday, May 27, 1991

#	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	4,4'-DDD	4	0	.		.
2	4,4'-DDE	4	0	.		.
3	4,4'-DDT	4	0	.		.
4	ALDRIN	4	0	.		.
5	AROCLOR-1016	4	0	.		.
6	AROCLOR-1221	4	0	.		.
7	AROCLOR-1232	4	0	.		.
8	AROCLOR-1242	4	0	.		.
9	AROCLOR-1248	4	0	.		.
10	AROCLOR-1254	4	0	.		.
11	AROCLOR-1260	4	0	.		.
12	CHLORDANE	4	0	.		.
13	DIELDRIN	4	0	.		.
14	ENDOSULFAN I	4	0	.		.
15	ENDOSULFAN II	4	0	.		.
16	ENDOSULFAN SULFATE	4	0	.		.
17	ENDRIN	4	0	.		.
18	ENDRIN KETONE	4	0	.		.
19	HEPTACHLOR	4	0	.		.
20	HEPTACHLOR EPOXIDE	4	0	.		.
21	HEXAVALENT CHROMIUM	4	0	.		.
22	METHOXYCHLOR	4	0	.		.
23	ORTHOPHOSPHATE	9	0	.		.
24	PARATHION, ETHYL	4	0	.		.
25	TOXAPHENE	4	0	.		.
26	alpha-BHC	4	0	.		.
27	beta-BHC	4	0	.		.
28	delta-BHC	4	0	.		.
29	gamma-BHC (LINDANE)	4	0	.		.
		121	0			

TABLE 16

Analyte groups for pesticide/PCB groundwater data with a limit of .05 5
ovL 15:42 Monday, May 27, 1991

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	% SOLIDS	2	0	.		.
2	4,4'-DDD	14	0	.		.
3	4,4'-DDE	14	0	.		.
4	4,4'-DDT	14	0	.		.
5	ALDRIN	14	0	.		.
6	AROCLOR-1016	14	0	.		.
7	AROCLOR-1221	14	0	.		.
8	AROCLOR-1232	14	0	.		.
9	AROCLOR-1242	14	0	.		.
10	AROCLOR-1248	14	0	.		.
11	AROCLOR-1254	14	0	.		.
12	AROCLOR-1260	14	0	.		.
13	CHLORDANE	14	0	.		.
14	DIELDRIN	14	0	.		.
15	ENDOSULFAN I	14	0	.		.
16	ENDOSULFAN II	14	0	.		.
17	ENDOSULFAN SULFATE	14	0	.		.
18	ENDRIN	14	0	.		.
19	ENDRIN KETONE	14	0	.		.
20	HEPTACHLOR	14	0	.		.
21	HEPTACHLOR EPOXIDE	14	0	.		.
22	HEXAVALENT CHROMIUM	11	0	.		.
23	METHOXYCHLOR	14	0	.		.
24	ORTHOPHOSPHATE	6	0	.		.
25	PARATHION, ETHYL	18	1	0.08	MG/L	0.08
26	TOXAPHENE	14	0	.		.
27	alpha-BHC	14	0	.		.
28	beta-BHC	14	0	.		.
29	delta-BHC	14	0	.		.
30	gamma-BHC (LINDANE)	14	0	.		.
		401	1			

TABLE 17

Analyte groups for pesticide/PCB surfacewater data with a limit of .05 6
15:42 Monday, May 27, 1991

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	4,4'-DDD	84	0	.		.
2	4,4'-DDE	84	0	.		.
3	4,4'-DDT	84	0	.		.
4	6-CHLORO-N,N'-DIETHYL-1,3,5-	2	0	.		.
5	ALDRIN	84	0	.		.
6	AMETRYN	2	0	.		.
7	AROCLOR-1016	84	0	.		.
8	AROCLOR-1221	84	0	.		.
9	AROCLOR-1232	84	0	.		.
10	AROCLOR-1242	84	0	.		.
11	AROCLOR-1248	84	0	.		.
12	AROCLOR-1254	84	0	.		.
13	AROCLOR-1260	84	0	.		.
14	ATRATON	2	0	.		.
15	ATRAZINE	4	3	0.57	UG/L	0.31333
16	CHLORDANE	8	0	.		.
17	DIELDRIN	84	0	.		.
18	ENDOSULFAN I	84	0	.		.
19	ENDOSULFAN II	84	0	.		.
20	ENDOSULFAN SULFATE	84	0	.		.
21	ENDRIN	84	0	.		.
22	ENDRIN KETONE	84	0	.		.
23	HEPTACHLOR	84	0	.		.
24	HEPTACHLOR EPOXIDE	84	0	.		.
25	HEXAVALENT CHROMIUM	26	0	.		.
26	METHOXYCHLOR	84	0	.		.
27	ORTHOPHOSPHATE	55	6	0.18	MG/L	0.11333
28	PARATHION, ETHYL	7	0	.		.
29	PROMETON	2	0	.		.
30	PROMETRYN	2	0	.		.
31	PROPAZINE	2	0	.		.
32	SIMETRYN	2	0	.		.
33	TERBUTRYN	2	0	.		.
34	TOXAPHENE	84	0	.		.
35	alpha-BHC	84	0	.		.
36	alpha-CHLORDANE	76	0	.		.
37	beta-BHC	84	0	.		.
38	delta-BHC	84	0	.		.
39	gamma-BHC (LINDANE)	84	0	.		.
40	gamma-CHLORDANE	76	0	.		.
		2368	9			

TABLE 18

Analyte groups for OU1 voc soilboring data with a limit of 5.0 32
19:42 Monday, May 27, 1991

S	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,1,1-TRICHLOROETHANE	84	13	110	UG/K	34.385
2	1,1,2,2-TETRACHLOROETHANE	84	0	.		.
3	1,1,2-TRICHLOROETHANE	84	3	27	UG/K	13.667
4	1,1-DICHLOROETHANE	84	0	.		.
5	1,1-DICHLOROETHENE	84	1	8	UG/K	8.000
6	1,2-DICHLOROETHANE	84	1	10	UG/K	10.000
7	1,2-DICHLOROPROPANE	84	0	.		.
8	2-BUTANONE	84	26	390	UG/K	99.038
9	2-HEXANONE	84	0	.		.
10	4-METHYL-2-PENTANONE	84	1	68	UG/K	68.000
11	ACETONE	84	73	650	UG/K	127.685
12	BENZENE	83	0	.		.
13	BROMODICHLOROMETHANE	84	0	.		.
14	BROMOFORM	84	0	.		.
15	BROMOMETHANE	84	1	6	UG/K	6.000
16	CARBON DISULFIDE	84	0	.		.
17	CARBON TETRACHLORIDE	84	0	.		.
18	CHLOROBENZENE	84	0	.		.
19	CHLOROETHANE	84	0	.		.
20	CHLOROFORM	84	0	.		.
21	CHLOROMETHANE	84	0	.		.
22	DIBROMOCHLOROMETHANE	84	0	.		.
23	ETHYLBENZENE	84	0	.		.
24	METHYLENE CHLORIDE	84	66	590	UG/K	47.227
25	STYRENE	84	0	.		.
26	TETRACHLOROETHENE	84	7	190	UG/K	71.000
27	TOLUENE	84	2	25	UG/K	15.500
28	TOTAL XYLENES	84	0	.		.
29	TRICHLOROETHENE	84	25	150	UG/K	22.948
30	VINYL ACETATE	84	0	.		.
31	VINYL CHLORIDE	84	0	.		.
32	cis-1,3-DICHLOROPROPENE	84	0	.		.
33	trans-1,3-DICHLOROPROPENE	84	0	.		.
		2771	219			

TABLE 19

Analyte groups for voc soilboring data with a limit of 5.0 11
19:42 Monday, May 27, 1991

NS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,1,1-TRICHLOROETHANE	68	3	180	UG/KG	145.00
2	1,1,2,2-TETRACHLOROETHANE	68	0	.		.
3	1,1,2-TRICHLOROETHANE	68	0	.		.
4	1,1-DICHLOROETHANE	68	0	.		.
5	1,1-DICHLOROETHENE	68	0	.		.
6	1,2-DICHLOROETHANE	68	3	32	UG/KG	16.00
7	1,2-DICHLOROPROPANE	68	0	.		.
8	2-BUTANONE	68	13	390	UG/KG	84.69
9	2-HEXANONE	68	0	.		.
10	4-METHYL-2-PENTANONE	68	1	120	UG/KG	120.00
11	ACETONE	68	56	1100	UG/KG	168.19
12	BENZENE	68	0	.		.
13	BROMODICHLOROMETHANE	68	0	.		.
14	BROMOFORM	68	0	.		.
15	BROMOMETHANE	68	0	.		.
16	CARBON DISULFIDE	68	1	58	UG/KG	58.00
17	CARBON TETRACHLORIDE	68	3	100	UG/KG	59.67
18	CHLOROBENZENE	68	0	.		.
19	CHLOROETHANE	68	2	50	UG/KG	28.50
20	CHLOROFORM	68	3	130	UG/KG	51.67
21	CHLOROMETHANE	68	0	.		.
22	DIBROMOCHLOROMETHANE	68	0	.		.
23	ETHYLBENZENE	68	3	780	UG/KG	360.33
24	METHYLENE CHLORIDE	68	37	150	UG/KG	31.48
25	STYRENE	68	1	17	UG/KG	17.00
26	TETRACHLOROETHENE	68	13	10000	UG/KG	1264.38
27	TOLUENE	68	8	640	UG/KG	163.50
28	TOTAL XYLENES	68	3	3300	UG/KG	1280.00
29	TRICHLOROETHENE	68	10	16000	UG/KG	3636.97
30	VINYL ACETATE	68	0	.		.
31	VINYL CHLORIDE	68	0	.		.
32	cis-1,3-DICHLOROPROPENE	68	1	6	UG/KG	6.00
33	trans-1,3-DICHLOROPROPENE	68	0	.		.
		2244	161			

TABLE 20

Analyte groups for voc sediment data with a limit of 5.0 12
19:42 Monday, May 27, 1991

I	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,1,1-TRICHLOROETHANE	37	0	.		.
2	1,1,2,2-TETRACHLOROETHANE	37	0	.		.
3	1,1,2-TRICHLOROETHANE	37	0	.		.
4	1,1-DICHLOROETHANE	37	0	.		.
5	1,1-DICHLOROETHENE	37	0	.		.
6	1,2-DICHLOROETHANE	37	0	.		.
7	1,2-DICHLOROPROPANE	37	0	.		.
8	2-BUTANONE	37	1	12	UG/KG	12.0000
9	2-HEXANONE	37	0	.		.
10	4-METHYL-2-PENTANONE	37	0	.		.
11	ACETONE	37	20	220	UG/G	59.5500
12	BENZENE	37	0	.		.
13	BROMODICHLOROMETHANE	37	0	.		.
14	BROMOFORM	37	0	.		.
15	BROMOMETHANE	37	0	.		.
16	CARBON DISULFIDE	37	1	6	UG/G	6.0000
17	CARBON TETRACHLORIDE	37	0	.		.
18	CHLOROBENZENE	37	0	.		.
19	CHLOROETHANE	37	0	.		.
20	CHLOROFORM	37	0	.		.
21	CHLOROMETHANE	37	3	60	UG/G	46.3333
22	DIBROMOCHLOROMETHANE	37	0	.		.
23	ETHYLBENZENE	37	0	.		.
24	METHYLENE CHLORIDE	37	10	54	UG/KG	16.9000
25	STYRENE	37	0	.		.
26	TETRACHLOROETHENE	37	0	.		.
27	TOLUENE	37	2	59	UG/KG	32.5000
28	TOTAL XYLENES	37	1	7	UG/KG	7.0000
29	TRICHLOROETHENE	37	2	8	UG/G	7.5000
30	VINYL ACETATE	37	0	.		.
31	VINYL CHLORIDE	37	0	.		.
32	cis-1,3-DICHLOROPROPENE	37	0	.		.
33	trans-1,3-DICHLOROPROPENE	37	0	.		.
		1221	40			

TABLE 21

Analyte groups for OU1 acid extractable soilboring data with a limit of 5.0

19:42 Monday, May 27, 1991 36

	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,6-TRICHLOROPHENOL	87	0	.		.
2	2,4-DICHLOROPHENOL	87	0	.		.
3	2,4-DIMETHYLPHENOL	87	0	.		.
4	2,4-DINITROPHENOL	87	0	.		.
5	2-NITROPHENOL	87	0	.		.
6	PENTACHLOROPHENOL	87	0	.		.
7	PHENOL	87	0	.		.
		609	0			

TABLE 22

Analyte groups for acid extractable soilboring data with a limit of 5.0 19
out
19:42 Monday, May 27, 1991

	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,6-TRICHLOROPHENOL	70	0	.		.
2	2,4-DICHLOROPHENOL	70	0	.		.
3	2,4-DIMETHYLPHENOL	70	0	.		.
4	2,4-DINITROPHENOL	70	0	.		.
5	2-NITROPHENOL	70	0	.		.
6	PENTACHLOROPHENOL	70	0	.		.
7	PHENOL	70	0	.		.
		490	0			

TABLE 23

Analyte groups for acid extractable sediment data with a limit of 5.0 20
19:42 Monday, May 27, 1991

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,6-TRICHLOROPHENOL	17	0	.		.
2	2,4-DICHLOROPHENOL	17	0	.		.
3	2,4-DIMETHYLPHENOL	17	0	.		.
4	2,4-DINITROPHENOL	17	0	.		.
5	2-NITROPHENOL	17	0	.		.
6	PENTACHLOROPHENOL	17	1	270	UG/KG	270
7	PHENOL	17	1	650	UG/KG	650
		119	2			

TABLE 24

Analyte groups for OU1 base neutral extractable soilboring data with a limit o

19:42 Monday, May 27, 1991 34

	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2-DICHLOROBENZENE	87	0	.		.
2	1,3-DICHLOROBENZENE	87	0	.		.
3	1,4-DICHLOROBENZENE	87	0	.		.
4	2,4-DINITROTOLUENE	87	0	.		.
5	2,6-DINITROTOLUENE	87	0	.		.
6	2-CHLORONAPHTHALENE	87	0	.		.
7	2-CHLOROPHENOL	87	0	.		.
8	3,3'-DICHLOROBENZIDINE	87	0	.		.
9	4-CHLORO-3-METHYLPHENOL	87	0	.		.
10	4-CHLOROPHENYL PHENYL ETHER	87	0	.		.
11	4-NITROPHENOL	87	0	.		.
12	ACENAPHTHENE	87	2	57	UG/K	57.00
13	ACENAPHTHYLENE	87	0	.		.
14	ANTHRACENE	87	3	81	UG/K	64.00
15	BENZO(a)ANTHRACENE	87	3	110	UG/K	76.67
16	BENZO(a)PYRENE	87	1	130	UG/K	130.00
17	BENZO(b)FLUORANTHENE	87	3	86	UG/K	60.33
18	BENZO(ghi)PERYLENE	87	1	50	UG/K	50.00
19	BENZO(k)FLUORANTHENE	87	3	180	UG/K	97.67
20	BIS(2-CHLOROETHOXY)METHANE	87	0	.		.
21	BIS(2-CHLOROETHYL)ETHER	87	0	.		.
22	BIS(2-CHLOROISOPROPYL)ETHER	87	0	.		.
23	BIS(2-ETHYLHEXYL)PHTHALATE	87	83	7214	UG/K	1238.96
	CHRYSENE	87	3	150	UG/K	94.33
	DI-n-BUTYL PHTHALATE	87	21	3643	UG/K	1117.86
26	DI-n-OCTYL PHTHALATE	87	2	265	UG/K	217.50
27	DIBENZO(a,h)ANTHRACENE	87	0	.		.
28	DIETHYL PHTHALATE	87	4	31	UG/K	28.50
29	DIMETHYL PHTHALATE	87	0	.		.
30	FLUORANTHENE	87	4	350	UG/K	247.50
31	FLUORENE	87	2	55	UG/K	54.50
32	HEXACHLOROBENZENE	87	0	.		.
33	HEXACHLOROBUTADIENE	87	0	.		.
34	HEXACHLOROETHANE	87	0	.		.
35	INDENO(1,2,3-cd)PYRENE	87	1	47	UG/K	47.00
36	ISOPHORONE	87	0	.		.
37	N-NITROSO-DI-n-PROPYLAMINE	87	0	.		.
38	NAPHTHALENE	87	0	.		.
39	NITROBENZENE	87	0	.		.
40	PHENANTHRENE	87	5	370	UG/K	203.40
		3480	141			

TABLE 25

Analyte groups for base neutral extractable soilboring data with a limit of 5.
ow2 19:42 Monday, May 27, 1991 15

'$	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2-DICHLOROBENZENE	70	0	.		.
2	1,3-DICHLOROBENZENE	70	0	.		.
3	1,4-DICHLOROBENZENE	70	0	.		.
4	2,4-DINITROTOLUENE	70	0	.		.
5	2,6-DINITROTOLUENE	70	0	.		.
6	2-CHLORONAPHTHALENE	70	0	.		.
7	2-CHLOROPHENOL	70	0	.		.
8	3,3'-DICHLOROBENZIDINE	70	0	.		.
9	4-CHLORO-3-METHYLPHENOL	70	0	.		.
10	4-CHLOROPHENYL PHENYL ETHER	70	0	.		.
11	4-NITROPHENOL	70	0	.		.
12	ACENAPHTHENE	70	1	57	UG/KG	57.00
13	ACENAPHTHYLENE	70	0	.		.
14	ANTHRACENE	70	1	74	UG/KG	74.00
15	BENZO(a)ANTHRACENE	70	2	84	UG/KG	60.00
16	BENZO(a)PYRENE	70	0	.		.
17	BENZO(b)FLUORANTHENE	70	2	61	UG/KG	47.50
18	BENZO(ghi)PERYLENE	70	1	50	UG/KG	50.00
19	BENZO(k)FLUORANTHENE	70	2	78	UG/KG	56.50
20	BIS(2-CHLOROETHOXY)METHANE	70	0	.		.
21	BIS(2-CHLOROETHYL)ETHER	70	0	.		.
22	BIS(2-CHLOROISOPROPYL)ETHER	70	0	.		.
23	BIS(2-ETHYLHEXYL)PHTHALATE	70	68	8100	UG/KG	1032.65
24	CHRYSENE	70	2	91	UG/KG	66.50
25	DI-n-BUTYL PHTHALATE	70	23	2702	UG/KG	480.57
26	DI-n-OCTYL PHTHALATE	70	2	75	UG/KG	65.50
27	DIBENZO(a,h)ANTHRACENE	70	0	.		.
28	DIETHYL PHTHALATE	70	3	31	UG/KG	29.33
29	DIMETHYL PHTHALATE	70	0	.		.
30	FLUORANTHENE	70	3	240	UG/KG	129.00
31	FLUORENE	70	1	54	UG/KG	54.00
32	HEXACHLOROBENZENE	70	0	.		.
33	HEXACHLOROBUTADIENE	70	0	.		.
34	HEXACHLOROETHANE	70	0	.		.
35	INDENO(1,2,3-cd)PYRENE	70	1	47	UG/KG	47.00
36	ISOPHORONE	70	0	.		.
37	N-NITROSO-DI-n-PROPYLAMINE	70	0	.		.
38	NAPHTHALENE	70	0	.		.
39	NITROBENZENE	70	0	.		.
40	PHENANTHRENE	70	3	310	UG/KG	145.67
		2800	115			

TABLE 26

Analyte groups for base neutral extractable sediment data with a limit of 5.0

19:42 Monday, May 27, 1991 16

	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2-DICHLOROBENZENE	17	0	.		.
2	1,3-DICHLOROBENZENE	17	0	.		.
3	1,4-DICHLOROBENZENE	17	0	.		.
4	2,4-DINITROTOLUENE	17	0	.		.
5	2,6-DINITROTOLUENE	17	0	.		.
6	2-CHLORONAPHTHALENE	17	0	.		.
7	2-CHLOROPHENOL	17	0	.		.
8	3,3'-DICHLOROBENZIDINE	17	0	.		.
9	4-CHLORO-3-METHYLPHENOL	17	0	.		.
10	4-CHLOROPHENYL PHENYL ETHER	17	0	.		.
11	4-NITROPHENOL	17	0	.		.
12	ACENAPHTHENE	17	0	.		.
13	ACENAPHTHYLENE	17	0	.		.
14	ANTHRACENE	17	1	130	UG/KG	130.000
15	BENZO(a)ANTHRACENE	17	1	200	UG/KG	200.000
16	BENZO(a)PYRENE	16	1	190	UG/KG	190.000
17	BENZO(b)FLUORANTHENE	16	1	240	UG/KG	240.000
18	BENZO(ghi)PERYLENE	16	0	.		.
19	BENZO(k)FLUORANTHENE	16	0	.		.
20	BIS(2-CHLOROETHOXY)METHANE	17	0	.		.
21	BIS(2-CHLOROETHYL)ETHER	17	0	.		.
22	BIS(2-CHLOROISOPROPYL)ETHER	17	0	.		.
23	BIS(2-ETHYLHEXYL)PHTHALATE	16	9	1300	UG/KG	351.111
24	CHRYSENE	17	1	200	UG/KG	200.000
25	DI-n-BUTYL PHTHALATE	17	8	400	UG/KG	172.500
26	DI-n-OCTYL PHTHALATE	16	0	.		.
27	DIBENZO(a,h)ANTHRACENE	16	0	.		.
28	DIETHYL PHTHALATE	17	0	.		.
29	DIMETHYL PHTHALATE	17	0	.		.
30	FLUORANTHENE	17	2	580	UG/KG	315.000
31	FLUORENE	17	0	.		.
32	HEXACHLOROBENZENE	17	0	.		.
33	HEXACHLOROBUTADIENE	17	0	.		.
34	HEXACHLOROETHANE	17	0	.		.
35	INDENO(1,2,3-cd)PYRENE	16	0	.		.
36	ISOPHORONE	17	0	.		.
37	N-NITROSO-DI-n-PROPYLAMINE	17	0	.		.
38	NAPHTHALENE	17	0	.		.
39	NITROBENZENE	17	0	.		.
40	PHENANTHRENE	17	1	530	UG/KG	530.000
		672	25			

TABLE 27

Analyte groups for OU1 pesticide/PCB soilboring data with a limit of 8.0 30
19:42 Monday, May 27, 1991

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	% SOLIDS	7	0	.		.
2	4,4'-DDD	82	0	.		.
3	4,4'-DDE	82	0	.		.
4	4,4'-DDT	82	0	.		.
5	ALDRIN	82	0	.		.
6	AROCLOR-1016	82	0	.		.
7	AROCLOR-1221	82	0	.		.
8	AROCLOR-1232	82	0	.		.
9	AROCLOR-1242	82	0	.		.
10	AROCLOR-1248	82	0	.		.
11	AROCLOR-1254	82	3	70	UG/K	52.3333
12	AROCLOR-1260	82	0	.		.
13	CHLORDANE	82	0	.		.
14	DIELDRIN	82	0	.		.
15	ENDOSULFAN I	82	0	.		.
16	ENDOSULFAN II	82	0	.		.
17	ENDOSULFAN SULFATE	82	0	.		.
18	ENDRIN	82	0	.		.
19	ENDRIN KETONE	82	0	.		.
20	HEPTACHLOR	82	0	.		.
21	HEPTACHLOR EPOXIDE	82	0	.		.
22	METHOXYCHLOR	82	0	.		.
23	TOXAPHENE	82	0	.		.
24	alpha-BHC	82	0	.		.
25	beta-BHC	82	0	.		.
26	delta-BHC	82	0	.		.
27	gamma-BHC (LINDANE)	82	0	.		.
		2139	3			

TABLE 28

Analyte groups for pesticide/PCB soilboring data with a limit of 8.0 7
DW 2 19:42 Monday, May 27, 1991

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	% SOLIDS	4	0	.		.
2	4,4'-DDD	69	0	.		.
3	4,4'-DDE	69	0	.		.
4	4,4'-DDT	69	0	.		.
5	ALDRIN	69	0	.		.
6	AROCLOR-1016	69	0	.		.
7	AROCLOR-1221	69	0	.		.
8	AROCLOR-1232	69	0	.		.
9	AROCLOR-1242	69	0	.		.
10	AROCLOR-1248	69	0	.		.
11	AROCLOR-1254	69	5	71	UG/KG	37.8
12	AROCLOR-1260	69	0	.		.
13	CHLORDANE	69	0	.		.
14	DIELDRIN	69	0	.		.
15	ENDOSULFAN I	69	0			.
16	ENDOSULFAN II	69	0			.
17	ENDOSULFAN SULFATE	69	0			.
18	ENDRIN	69	0			.
19	ENDRIN KETONE	69	0			.
20	HEPTACHLOR	69	0	.		.
21	HEPTACHLOR EPOXIDE	69	0	.		.
22	METHOXYCHLOR	69	0	.		.
23	TOXAPHENE	69	0	.		.
24	alpha-BHC	69	0	.		.
25	beta-BHC	69	0	.		.
26	delta-BHC	69	0	.		.
27	gamma-BHC (LINDANE)	69	0	.		.
		1798	5			

TABLE 29

Analyte groups for pecticide/PCB sediment data with a limit of 8.0 8
our
11:42 Monday, May 27, 1991

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	4,4'-DDD	18	0	.		.
2	4,4'-DDE	18	0	.		.
3	4,4'-DDT	18	0	.		.
4	ALDRIN	18	0	.		.
5	AROCLOR-1016	18	0	.		.
6	AROCLOR-1221	18	0	.		.
7	AROCLOR-1232	18	0	.		.
8	AROCLOR-1242	18	0	.		.
9	AROCLOR-1248	18	0	.		.
10	AROCLOR-1254	18	0	.		.
11	AROCLOR-1260	18	0	.		.
12	CHLORDANE	3	0	.		.
13	DIELDRIN	18	0	.		.
14	ENDOSULFAN I	18	0	.		.
15	ENDOSULFAN II	18	0	.		.
16	ENDOSULFAN SULFATE	18	0			.
17	ENDRIN	18	0			.
18	ENDRIN KETONE	18	0			.
19	HEPTACHLOR	18	0	.		.
20	HEPTACHLOR EPOXIDE	18	0	.		.
21	HEXAVALENT CHROMIUM	3	0	.		.
22	METHOXYCHLOR	18	0	.		.
23	TOXAPHENE	18	0	.		.
24	alpha-BHC	18	0	.		.
25	alpha-CHLORDANE	15	0	.		.
26	beta-BHC	18	0	.		.
27	delta-BHC	18	0	.		.
28	gamma-BHC (LINDANE)	18	0	.		.
29	gamma-CHLORDANE	15	0	.		.
		486	0			

REFERENCES

EPA, 1988, Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA: OSWER Directive 9355.3-01.

EPA, 1989, Data Quality Objectives for Remedial Response Activities: OSWER Directive 9355.0-7B.

5/16/91

General Approach to Identifying a Site-Specific Chemical Analysis Roster

Basis

- OSWER 9355.3-01, Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA

  Section 2.2.2, Collect and Analyze Existing Data

- OSWER 9355.0-7B, Data Quality Objectives for Remedial Response Activities

  Section 3.2, Evaluate Available Information

- Historical Superfund Practice in Applying Existing Data, Filling Data-Gaps, and Phased Approaches

The Approach

I Analysis of Existing Data

THC - metals only
TCL - all compounds

A) Evaluate historical data regarding waste-related activities

B) Comparison of existing data on a (1) media by media and (2) area by area basis.

C) Comparison by "Analytical Suites"

This exercise yields 1 of three possible outcomes

1) **Case 1:** The comparison demonstrates 1 or more analytical suites in a specified media and area have not been detected at a given detection limit.

2) **Case 2:** The comparison demonstrates 1 or more analytes from a suite have been detected either inconsistently or at low concentrations. This outcome suggests that supplemental evaluation is warranted.

3) **Case 3:** The comparison demonstrates consistent detections of 1 or more analytes from a suite have been detected.

II Data Usability Assessment

A) Evaluate usability based on application.

- o Detection limits - are they suffic
- o Matrix interferences - we don't see all contam
- o Consistency - of data

III Fate & Transport Assessment (Supplemental)

A) Evaluate the potential fate and transport characteristics of analytical suites and troublesome compounds in each suite. Emphasis on "inter-media" transfer aspects. (See attached) i.e. Base Neutrals.

IV Risk & Chemical-Specific ARAR Comparison (Supplemental)

A) Evaluate the relevance of overlooking something significant in-terms of impact on the overall site risk.

Findings of This Analysis

1) **Case 1:** A Case 1 finding is an objective and rationale demonstration that the analytical suite is not present in the area-specific media.

Sampling and analysis for this suite (area-media specific) is not necessary to achieve RFI/RI objectives because characterization is adequate.

2) **Case 2:** A Case 2 finding appeals to supplemental assessments (mobility & toxicology/ARARs).

Sampling and analysis for this suite may not be necessary to achieve RFI/RI objectives. Situation-specific confirmation sampling and analysis may be required to achieve RFI/RI objectives.

3) **Case 3:** A Case 3 finding suggests that further investigative sampling and analysis may be required to achieve RFI/RI objectives.

Example Demonstration
Deep Soils and Groundwater *
Phase III OU-1

Matrix: Deep Soil

Analytical Suite	Hits /Analyses	Case	Comment
Pesticides/PCB's	0 / 121	1	No History of Release At The Site
Acid Extractables	0 / 609	1	No History of Release At The Site
Base-Neutral Exts.	141 / 3480	2	No History of Release At The Site — Extremely Immobile In Soils
VOC's	219 / 2771	3	Assumed To Be Site-Related
Radionuclides	714 / 1105	3	Assumed To Be Site-Related

Phthalates.

Matrix: Ground-Water

Analytical Suite	Hits /Analyses	Case	Comment
Pesticides/PCB's	0 / 121	1	No History of Release At The Site
Acid Extractables	0 / 21	1	No History of Release At The Site
Base-Neutral Exts.	1 / 120	2	No History of Release At The Site — Extremely Immobile In Saturated Soils
VOC's	262 / 6760	~~2~~ 3	Assumed To Be Site-Related
Radionuclides	974 / 1261	3	Assumed To Be Site-Related

+ Phthalates.

Acetone / Methylene chloride (lab contam.?)

* Detection Limits Are Standard CLP Performance

ENVIRONMENTAL FATE AND TRANSPORT
(See Notes)

RCS Variables

Group A Compounds, TCL Volatile Organics

I Ketones & Aldehydes

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env. Mobility
Acetone	55.1	0.1	270.00	0.013	60000.0	-0.24	1.25	2.6	6	Extremely Mobile

II Monocyclic Aromatics

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env. Mobility
Benzene	78.1	0.9	76.00	0.182	1780.0	2.13	1.81	6.8	3	Very Mobile
Toluene	92.1	0.9	22.00	0.214	515.0	2.69	2.48	28.2	2	Very Mobile
Ethyl Benzene	106.2	0.9	7	0.266	152.0	3.34	3.04	100.0	-0	Slightly Mobile
Xylene	106.2	0.9	10	0.380	152.0	3.13	2.11	12.6	1	Very Mobile

III Chlorinated Aliphatics

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env. Mobility
Carbon Tetrachloride	153.8	1.6	90.00	0.960	785.0	2.96	2.64	40.5	2	Very Mobile
Trichloroethene	131.4	1.5	60.00	0.390	1100.0	2.42	2.10	12.3	3	Very Mobile
Chloroform	119.4	1.5	160.00	0.130	8000.0	1.97	1.64	4.9	4	Very Mobile
1,1,2,2-Trichloroethane	167.9	1.6	5.00	0.016	2900.0	2.39	2.07	11.6	2	Very Mobile

IV Acid Extractables (Phenolics)

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env. Mobility
Phenol	94.1	1.1	0.20	1.2E-04	8200.0	1.46	1.15	2.3	2	Very Mobile
Pentachlorophenol	266.4	2.0	1.1E-04	1.1E-04	14.0	5.18	4.72	4771.3	-8	Immobile
2,4-Dinitrophenol	184.1	1.7	1.5E-05	2.7E-08	5600.0	1.54	1.22	2.5	-2	Slightly Immobile
2,4,6-Trichlorophenol	197.5	1.5	0.012	1.6E-04	800.0	3.61	3.30	181.0	-2	Slightly Immobile

V Base-Neutral Extractables

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env. Mobility
Bis(2-ethylhexyl)phthalate	391.1	1.0	2.7E-07	4.4E-06	1.3	9.61	9.30	1.8E+08	-16	Very Immobile
Chrysene	228.2	1.3	1.0E-11	6.9E-08	0.0	5.61	5.30	1.8E+04	-19	Very Immobile
1,2,4-Trichlorobenzene	181.5	1.5	0.29	9.6E-02	30	4.28	3.96	8.3E+02	-3	Slightly Immobile
1,3-Dichlorobenzene	147.0	1.3	2.28	1.5E-01	123	4.28	3.96	8.3E+02	-2	Slightly Immobile
Naphthalene	128.2	1.0	0.087	1.9E-02	31.7	3.29	2.97	8.6E+01	-3	Slightly Immobile
Benzo(a)pyrene	252.0	1.4	5.6E-09	2.0E-05	3.8E-03	6.06	6.74	5.0E+05	-17	Very Immobile
2,4-Dinitrotoluene	182.1	1.3	0.0051	1.9E-04	270	1.98	1.65	5.1E+00	-2	

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env. Mobility
PCB-1248	299.5	1.4	4.9E-04	1.5E-01	0.054	5.76	5.44	24931.0	-10	Immobile
PCB-1254	328.4	1.5	7.7E-05	4.6E-02	0.0	6.03	5.72	47233.7	-11	Very Immobile
PCB 1260	375.7	1.6	4.1E-05	2.8E-01	0.0	7.15	6.82	594625.1	-14	Very Immobile

VII Chlorinated Pr icides

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env. Mobility
Dieldrin	381.0	1.8	1.8E-07	1.9E-05	0.2	3.54	3.23	153.8	-11	Very Immobile
DDT	375.7	1.6	1.9E-07	7.1E-04	5.5E-03	6.91	6.59	350141.6	-16	Very Immobile
Heptachlor	375.0	1.6	3.0E-04	3.4E-02	0.18	4.4	4.1	1081.0	-8	Immobile
Lindane	291.0	1.6	2.5E-05	2.5E-04	1.6	3.9	3.6	343.0	-8	Immobile
Chlordane	409.8	1.6	1.0E-05	4.0E-03	0.056	5.5	5.1	12601.0	-11	Very Immobile
Toxaphene	414.0	1.6	0.3	1.4E+01	0.5	3.3	3.0	87.8	-4	